Amendments to the Claims:

Please amend claims 1, 5, 9, 11, 16, 20, 32, 36, 38, 41, 42, 45, 57, 60, 61, 64, 71, and 74, and cancel claims 28, 31, 65, 69 and 70, as shown in the following listing of claims. This listing of claims will replace all prior versions and listings of claims in the application.

1. (currently amended) A method for high-speed transmission of information data on an optical channel, the method comprising:

encoding information via a trellis encoder to produce digital multilevel symbols;

~~equalizing the digital multilevel symbols to compensate for characteristics of the optical channel, said equalizing comprising precoding the digital multilevel symbols using a Tomlinson-Harashima precoder;~~

converting the digital multilevel symbols into analog multilevel signals; and

transmitting the analog multilevel signals over the optical channel.

2-4. (cancelled)

5. (currently amended) The method of claim ~~1~~ 81 wherein equalizing the digital multilevel symbols comprises precoding the digital multilevel symbols using a dynamic limiting precoder.

6. (previously presented) The method of claim 1 wherein the information that is encoded comprises input bits and wherein encoding the information includes mapping the input bits into digital multilevel symbols.

7. (previously presented) The method of claim 1 wherein transmitting the analog multilevel signals over an optical channel comprises modulating the intensity of a light source according to the level of the analog multilevel signals.

8. (previously presented) The method of claim 1 wherein transmitting the analog multilevel signals over an optical channel comprises modulating laser intensity according to the level of the analog multilevel signals.

9. (currently amended) A method as in claim ~~1~~ 81 wherein equalizing the digital multilevel symbols to compensate for the laser and channel characteristics comprises:

characterizing the channel; and

applying an inverse characterization of the channel to the digital multilevel symbols.

10. (cancelled)

11. (currently amended) A method for high speed transmission on an optical channel, the method comprising:

accepting information from a plurality of sources;

encoding the information via a plurality of trellis encoders to produce a plurality of digital multilevel symbols;

~~equalizing the plurality of digital multilevel symbols to compensate for characteristics of the optical channel, said equalizing comprising precoding the digital multilevel symbols using a Tomlinson-Harashima precoder;~~

converting the plurality of digital multilevel symbols into a plurality of analog multilevel signals; and

transmitting the analog multilevel signals by time division multiplexing the plurality of analog multilevel signals onto an optical channel.

12. (previously presented) A method as in claim 11 wherein the accepted information comprises input bits and wherein encoding the information comprises:

mapping the input bits into digital multilevel symbols.

13-15. (cancelled)

16. (currently amended) The method of claim ~~11~~ 84 wherein equalizing the digital multilevel symbols comprises precoding the digital multilevel symbols using a dynamic limiting precoder.

17. (cancelled)

18. (previously presented) The method of claim 11 wherein transmitting the analog multilevel signals over an optical channel comprises modulating the intensity of a light source according to the level of the analog multilevel signals.

19. (previously presented) The method of claim 11 wherein transmitting the analog multilevel signals over an optical channel comprises modulating laser intensity according to the level of the analog multilevel signals.

20. (currently amended) The method of claim ~~11~~ 84 wherein equalizing the digital multilevel symbols to compensate for the laser and channel characteristics comprises:

characterizing the channel; and

using an inverse characterization of the channel to modify the digital multilevel symbols.

21. (cancelled)

22. (previously presented) The method of claim 11 wherein converting the plurality of digital multilevel symbols into a plurality of analog multilevel signals comprises:

accepting the plurality of multilevel symbols successively into a single analog to digital converter; and

successively converting the plurality of symbols into analog multilevel signals.

23. (previously presented) The method of claim 11 wherein converting the plurality of digital multilevel symbols into a plurality of analog multilevel signals comprises:

accepting the plurality of multilevel symbols successively into a plurality of analog to digital converters; and

converting the plurality of symbols into an analog representation; and

successively combining the analog multilevel signals into a succession of analog multilevel signals.

24-31.

32. (currently amended) An apparatus for transmitting information on an optical channel, the apparatus comprising:

a trellis encoder for accepting digital information and producing digital multilevel signals;

~~an equalizer that accepts the digital multilevel signals and produces equalized digital multilevel signals, the equalizer comprising a Tomlinson-Harashima precoder;~~

a digital-to-analog converter that accepts the equalized digital multilevel signals and produces analog multilevel signals; and

an analog signal to optical converter that converts the multilevel analog signals to ~~an~~ multilevel optical signals for coupling into an optical channel.

33-35. (cancelled)

36. (currently amended) An apparatus as in claim ~~32~~ 87 wherein the equalizer is a dynamic limiting precoder.

37. (previously presented) An apparatus as in claim 32 wherein the analog signal to optical converter includes a laser.

38. (currently amended) An apparatus for concurrently transmitting a plurality of data signals over an optical channel, the apparatus comprising:

a plurality of trellis encoders that accept a plurality of data signals and produce a plurality of digital multilevel signals;

~~a plurality of equalizers that accept the plurality of digital multilevel signals and produce a plurality of equalized digital multilevel signals, each equalizer comprising a Tomlinson-Harashima precoder;~~

a converter that accepts the plurality of equalized digital multilevel signals and produces a plurality of analog multilevel signals; and

an optical source that receives the plurality of analog multilevel signals and produces a light output proportional to the level of successive analog multilevel signals for driving an optical channel.

39-40. (cancelled)

41. (currently amended) An apparatus as in claim ~~38~~ 90 wherein the plurality of equalizers comprise at least one dynamic limiting precoder.

42. (currently amended) An apparatus for concurrently transmitting a plurality of data signals over an optical channel, the apparatus comprising:

a plurality of trellis encoders that accept a plurality of data signals and produce a plurality of digital multilevel signals;

~~a plurality of equalizers that accept the plurality of digital multilevel signals and produce a plurality of equalized digital multilevel signals, each equalizer comprising a Tomlinson-Harashima precoder;~~

a digital-to-analog converter that sequentially accepts the plurality of equalized digital multilevel signals and produces a plurality of sequential analog multilevel signals; and

an optical source that receives the plurality of analog multilevel signals for driving an optical channel.

43-44. (cancelled)

45. (currently amended) An apparatus as in claim ~~42~~ 92 wherein the plurality of equalizers comprise at least one dynamic limiting precoder.

46-56. (cancelled)

57. (currently amended) A method of signaling over an optical channel, the method comprising:

accepting data from a source;

multilevel modulating the data;

~~equalizing the data, said equalizing comprising precoding the data using a Tomlinson-Harashima precoder;~~

coupling the ~~equalized encoded~~ multilevel-modulated data into an optical channel;

conveying the multilevel-modulated data over the optical channel;

accepting multilevel-modulated data from the optical channel;

~~decoding~~ demodulating the multilevel-modulated data accepted from the optical channel; and

providing the ~~decoded~~ demodulated data to an interface.

58-59. (cancelled)

60. (currently amended) A method as in claim ~~57~~ 94 wherein equalizing the data comprises applying a dynamic limiting precoding.

61. (currently amended) A method of signaling over an optical channel, the method comprising:

accepting data from a source;

multilevel modulating the data;

~~equalizing the data, said equalizing comprising precoding the data using a Tomlinson-Harashima precoder;~~

coupling the ~~equalized encoded~~ multilevel-modulated data into an optical channel;

conveying the multilevel-modulated data over the optical channel;

accepting multilevel-modulated data from the optical channel;

converting the multilevel-modulated data accepted from the optical channel to multilevel-modulated digital data;

~~decoding~~ demodulating the multilevel-modulated digital data accepted from the optical channel; and

providing the ~~decoded~~ demodulated data to an interface.

62-63. (cancelled)

64. (currently amended) A method as in claim ~~61~~ 96 wherein equalizing the data comprises applying a dynamic limiting precoding.

65-70. (cancelled)

71. (currently amended) An apparatus for concurrently transmitting a plurality of data signals over an optical channel, the apparatus comprising:

a plurality of modulators that accept a plurality of data signals and produce a plurality of digital multilevel signals;

~~a plurality of equalizers that accept the plurality of digital signals and produce a plurality of equalized digital signals, each equalizer comprising a Tomlinson-Harashima precoder;~~

a converter that accepts the plurality of ~~equalized~~ digital multilevel signals and produces a plurality of analog multilevel signals; and

an optical source that receives the plurality of analog signals and produces a light output proportional to the level of successive analog multilevel signals for driving an optical channel.

72-73. (cancelled)

74. (currently amended) An apparatus as in claim ~~71~~ 98 wherein the plurality of equalizers comprise at least one dynamic limiting precoder.

75-80. (cancelled)

81. (new) The method of claim 1 further comprising equalizing the digital multilevel symbols to compensate for characteristics of the optical channel.

82. (new) The method of claim 1 further comprising of equalizing the analog multilevel symbols to compensate for characteristics of the optical channel.

83. (new) The method of claim 81 wherein equalizing the digital multilevel symbols comprises preceding the digital multilevel symbols using a Tomlinson-Harashima precoder.

84. (new) The method of claim 11 further comprising equalizing the plurality of digital multilevel symbols to compensate for characteristics of the optical channel.

85. (new) The method of claim 11 further comprising equalizing the plurality of analog multilevel symbols to compensate for characteristics of the optical channel.

86. (new) The method of claim 84 wherein equalizing the digital multilevel symbols comprises preceding the plurality of digital multilevel symbols using a Tomlinson-Harashima precoder.

87. (new) The apparatus of claim 32 further comprising an equalizer that accepts the digital multilevel signals and produces equalized digital multilevel signals prior to coupling into the digital-to-analog converter.

88. (new) The apparatus of claim 32 further comprising an equalizer that accepts the analog multilevel signals and produces equalized analog multilevel signals.

89. (new) An apparatus as in claim 87 wherein the equalizer is a Tomlinson-Harashima precoder.

90. (new) An apparatus as in claim 38 further comprising a plurality of equalizers that accept the plurality of digital multilevel signals and produce a plurality of equalized digital multilevel signals to provide to the converter.

91. (new) An apparatus as in claim 90 wherein the plurality of equalizers comprise a plurality of Tomlinson-Harashima precoders.

92. (new) An apparatus as in claim 42 further comprising a plurality of equalizers that accept the plurality of digital multilevel signals and produce a plurality of digital multilevel signals.

93. (new) An apparatus as in claim 92 wherein the plurality of equalizers comprise a plurality of Tomlinson-Harashima precoders.

94. (new) A method as in claim 57 further comprising equalizing the data after multilevel modulating the data.

95. (new) A method as in claim 94 wherein equalizing the data comprises applying a Tomlinson-Harashima precoding to the data.

96. (new) A method as in claim 61 further comprising equalizing the data after multilevel modulating the data.

97. (new) A method as in claim 96 wherein equalizing the data comprises applying a Tomlinson-Harashima precoding to the data.

98. (new) An apparatus as in claim 71 further comprising a plurality of equalizers that accept the plurality of digital signals and produce a plurality of equalized digital signals to provide to the converter.

99. (new) An apparatus as in claim 98 wherein the plurality of equalizers comprise a plurality of Tomlinson-Harashima precoders.